NOTE CONCERNING THE ORIGIN OF POLARITY IN THE FROG'S EGG. A CORRECTION.

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In connection with work published in 1919 (BIOL. BULL., Vol. 37: 312–361) on the modification and control of development in the frog egg, it seemed desirable to determine if possible the origin of the polarity of the egg. The position taken was that polarity must be either a matter of inheritance or of determination by factors external to the egg. If the former possibility is true the problem is, of course, simply made more remote. The second possibility, since it is known or believed that polarity arises in a number of plant and animal eggs, in response to external factors, seemed the logical one to test, especially since it is the one most readily investigated experimentally. The first question was to determine the relation, if any, between the polarity of the egg and its mode of attachment to the ovarian membrane. Here it was found and it has since been confirmed, that in 75–80 *per cent.* of the cases, the pedicle which attaches the follicle to the ovarian membrane, is located on or within 20° of the equatorial region of the egg. Since a band 40° wide over the equatorial region of a sphere involves only about 34 *per cent.* of the total area it would seem that the pedicle is not located at random over the surface of the egg but with reference to some other factor, or factors.

Since the polar axes of the ovarian eggs bear every relation to gravity this factor is made highly improbable as having any influence on the origin of polarity.

The next question to arise was the relation of the polarity of the egg to its food and oxygen supply—the blood flowing through the follicular vessels. From observations made at that time on both injected and living specimens I believed and stated, p. 321, of the above mentioned paper, that " . . . in every case observed, the greater part of the arterial blood supply was restricted to the pigment hemisphere " and that the blood supply of the unpigmented hemisphere was largely venous. It was further sug-

gested that "the data indicate that polarity in the egg arises . . . in response to external conditions, viz., to the blood supply of the egg: that region of the oögonium chancing to be most richly supplied with arterial blood being destined to become, by virtue of this respiratory and nutritive relation, the animal pole of the egg."

It may be stated here that the problem was by no means considered solved and in 1919 plans for its further and more complete investigation were fairly well worked out. The investigation has continued with numerous interruptions and is still incomplete, but pending its outcome it has seemed desirable to make this statement.

It now appears that the previous observations were not sufficiently extensive to warrant the general statements indicated above. Certainly there is a considerable range of variation from what I thought was the typical situation and illustrated in Fig. 3 of the 1919 paper. And, it may be added, the figure is correct. But, on the other hand, cases have been observed more recently where the vegetative hemisphere was largely supplied by arterial blood, as well as various intermediate conditions. Furthermore one occasionally finds in the vessels that run to the follicle in the *mature* or nearly mature egg, a direct shunt between the small artery and vein. As far as the existence of any definite relation between the polarity of the *mature* or *nearly mature* egg and arterial or venous blood supply is concerned, I am obliged to withdraw the suggestion as it first appeared. It seems evident enough that polarity must be established early in the history of the egg, possibly in relation to the vascular supply. Supposing, as a working hypothesis, that such is the case it is conceivable that the vascularization in the follicle may change considerably especially as the egg approaches maturity—the only stage previously examined. It is along these lines that the investigation is being continued with the hope of throwing further light on the question.